Cambridge Recycling Participation Study
Status Report After Completion of "12-Month" Monitoring

Submitted by:
Clear View Consulting
164 West River Street
Orange, MA 01364
(978) 544-5872

Introduction

This status report describes the second and final round of follow-up monitoring of recycling participation in a study of 567 households in East Cambridge, roughly 12 months after completion of the outreach techniques the study is designed to test. Although some obstacles were encountered, in the end this round of monitoring was completed on schedule and substantially the way it was designed.

This round of monitoring found increases in set-out rates, overall participation, and average weights of set-outs pretty much across the board. This report provides summary statistics for the entire study area and each of the two monitoring routes; detailed analysis of specific household results and interpretation of what the results mean for the outreach techniques will be addressed separately over the next several weeks.

Planning Stages

Planning for this phase of the study began in mid-April. The first priority was to confirm junior staffing arrangements for the monitoring. As of 4/22, it appeared that CVC would be able to use the same staff used for the "3-month" monitoring in the fall of 2002 (but see "Obstacles", below). Second on the list of preparations was to be sure that no major changes had occurred that would affect the monitoring plan. This was accomplished through a combination of a complete walk-through of both monitoring routes (conducted on 5/1) and communication through DPW staff with F.W. Russell, the collection contractor, to make sure that they had not made changes in how they collected their routes.

As a further step to ensure a smooth round of monitoring, and to better document this project, it was decided to have new, improved maps of the monitoring routes prepared. With terrific assistance from DPW staff (in both Recycling and Engineering), this was accomplished very quickly in early May. A set of these maps accompanies this report.

Another aspect of the pre-planning phase was to begin to think through the lines of analysis that would be necessary in order to reach conclusions regarding this project. It seemed important to identify any additional items which could be addressed during the fieldwork and which might aid in the analysis. The biggest area (previously identified but not worked on until May) was household turnover. In the field, this translated to a renewed effort to spot obvious move-outs/move-ins and in particular buildings, which, due to renovation, appeared to have completely turned over during the course of this project. It

was also decided that we should more thoroughly address the question of whether we were missing a significant number of set-outs on the earliest parts of the monitoring routes.

Procedures

Monitoring for this phase was planned to be conducted on Thursday 5/15, Thursday 5/22, Friday 5/30 (holiday delay), Thursday 6/5, and Thursday 6/12. The contract required two weeks of actual weighing of set-outs, with estimation techniques used the remaining three weeks on each of the two monitoring routes. A rotation of staff was planned so that all portions of the study area would get (as close as possible) the same mix of monitoring effort. This rotation was also designed to spread any inadvertent biases evenly across the study area, so that an individual's bias in weight and/or numbers estimating would not need to be a big worry in analyzing the results. See Attachment One for details of the rotation as finally executed.

All field staff were trained in the procedures developed for the "Estimating Guide" earlier in this project, both with respect to estimating numbers and weights of set-outs. Key points were reinforced during pre- and post-monitoring conversations with staff on each individual monitoring day. Of course, despite all efforts to ensure as much consistency as possible, it is almost certain that individual variation did occur to some degree.

As in the "before" and "3-month" phases, CVC used a master spreadsheet (in Lotus 1-2-3, to facilitate conversion to the required Lotus Approach database) to generate weekly field sheets and accumulate data from each week's monitoring. Then, once fieldwork was completed, the formatting needed for the field worksheets was removed and the spreadsheet was edited into the format needed for conversion to the Approach database.

Obstacles Encountered and Steps Taken to Counter Them

On May 1, the person hired as the second route monitor disclosed that he had found another job and might not be available during the planned monitoring weeks. After a week or so of uncertainty, on May 8 a concerted recruitment effort for a new monitoring staffperson was launched with assistance from DPW staff. Fifteen people responded, most of whom were "interviewed" via phone calls and/or e-mail. Two finalists were selected to attend training on Weds., 5/14. Since both seemed completely capable of handling the work, the one who had responded first (Joellen Secondo) was selected. She performed quite competently, showing up on time all five mornings of monitoring, and completing all her work as requested.

On May 8, one route (West) was monitored, to provide a "spare" in case of any staff "no-shows", weather problems, or any other unanticipated setbacks.

On May 15, the first day of planned monitoring, the temp who CVC thought had been all confirmed by his temp agency did not show up. His role was to have been to be the weighing assistant on the route where actual weights were being obtained. Both routes were instead monitored using estimating techniques, which in itself was not a serious setback since one week (scheduled to be May 30) was to have been completed that way

anyhow. Due to continuing difficulties confirming the temp (and the fact that the project was once again over budget), it was decided that the two weeks that Rick Innes was to monitor using actual weighing, it would be done as a one-man team rather than two. While this was a difficult juggling act, in the end it proved successful. The other finalist from the 5/14 training was then hired as a weighing assistant for the two weeks that Joellen Secondo was to monitor using actual weighing.

Double-Checks of Early Parts of Routes

As noted above, one concern we wanted to address much more thoroughly than we had been able to in the 3-month monitoring was the possibility that, in starting our monitoring shortly after 6:00 a.m., we might be missing some number of set-outs that households were not bringing to the curb until after we had passed by. While the project budget made hiring another temp to double-check the early parts of the two routes impossible, DPW staff volunteered to perform the checks themselves. Thus, we were able to double-check each route twice (the West route on 5/15 and 6/5, and the East route on 5/22 and 5/30). The rotation we used allowed each CVC staff monitor's work to be checked twice as well. The results of this effort appear as Attachment Two. In general, we found that we were missing a few set-outs, but not a large number. Additional set-outs noted by the second monitor were added to our database, and thus lifted the set-out and overall participation numbers a bit.

Overview of Results

A summary of set-out rates and overall participation appears as Attachment Three. Overall participation across the entire study area rose from 20.2% in the 3-month monitoring period to 25.2% during the 12-month monitoring. While this would not really be expected as a direct result of the outreach efforts this study is attempting to evaluate, it might be explainable entirely as a result of household turnover. As before, participation was higher on the West route than on the East, at 26.6% versus 23.8%. However, this represented a significant climb on the East route, up from 17.7% during the 3-month monitoring. The 3-month participation on the West route had been 22.7%.

Set-out rates for the entire study area averaged 11.5%, varying from a low of 9.9% on 5/15 to a high of 13.9% on 5/22. Monitoring staff theorized that the latter number was in part driven by impending moves and upcoming vacations over the Memorial Day weekend. Average set-out rates on the West route were quite stable, averaging 13.5% and ranging from a low of 12.9% to a high of 14.3%. On the East route, set-out rates were much more variable, with an average of 9.5%, a low of 6.4%, and a high of 14.2%. All of these numbers were up across the board from the 3-month results.

One key statistic that Clear View Consulting always tracks in recycling participation studies is the ratio between average set-out rates and overall participation. Generally, the higher the ratio, the more consistent is household participation, and participation is easier to accurately measure. When that ratio is lower, household participation is less regular, and overall participation is harder to measure with complete accuracy (the only real way to overcome this problem is to add one or more weeks of extra monitoring). As it was in the

3-month results, the ratio in this case was an unusually low 0.46. The ratio in the higher-participation West route was 0.51, while on the East route it was only 0.40.

Some analysis of weights of set-outs appears as Attachment Four. The average weights observed increased in the 12-month monitoring compared to the 3-month period, from 11.2 pounds to almost 13.3 pounds. While this was partly due to a handful of truly staggering set-outs (the largest actually weighed at 220 pounds), there was some across-the board increase in set-outs that would be considered normal in many higher-participation recycling areas (10 to 25 pounds). However, both for the study area as a whole and particularly the East route, there was an unusual number of set-outs in the 0-5 pound and 5-10 pound ranges.

A comparison of weight results from use of the estimating technique versus actual weighing might appear to suggest that the estimating technique is underestimating weights significantly, at an average of 12.3 pounds versus 14.8 for weighing. However, when the handful of fluky huge set-outs are set aside, the gap narrows significantly, and much of the rest if probably explained by random variation in the "population" being measured. CVC continues to believe that the estimating technique, properly applied, should yield results within 5-10% of actual weights, with perhaps a slight bias toward the low side.

Buildings That Should Be Dropped From Study

Observations began to accumulate even during the outreach phase of this study, and certainly during the 3-month monitoring, of buildings that for one reason or another no longer appeared to fit the criteria for this study. These ranged from buildings under renovation to a previously undetected set-out location or arrangement to (in one case) a building management company that was emptying recyclables that residents had placed in blue bins into the trash! This pattern continued during the 12-month monitoring. The accumulated list of "suspect" buildings appears as Attachment Five. Decisions about which of these buildings are to be dropped need to be agreed to by all parties before the final round of analysis is conducted.

"False Positive" and "False Negative" Issues

In any study that attempts to capture a complex behavior (and the ways people find to set out recycling in a dense urban area certainly qualify as complex behavior), there is always a worry about "false positives" and "false negatives". In this case, a false positive would be identifying a recycling set-out/participant where one did not really exist; conversely, a false negative would be failing to identify a set-out/participant that did exist. Since this study technique relies on the notion that a set-out observed on the street can be linked in some way to a particular building or address, a cautionary anecdote may be in order. Mid-way through the 12-month monitoring, a CVC staffperson monitoring the East route was walking west on Thorndike Street when he observed a man emerge from his front door carrying a blue bin, and walk at least four doors down the street to set it next to someone else's blue bin. Fortunately, his address was not part of this study – the bin was not marked with an address, so there was virtually no way we could have identified the set-out as coming from his address. But it is worth remembering that our study results

probably do suffer from at least a handful of similar cases where no cue was available to alert us to the false negative.

A false positive might come about from a too-generous assessment by a staffperson of something set on the curb being intended as a recycling set-out. Examples might include a bag of paper set out in a collectable way but not really intended by the household for recycling, or a corrugated cardboard box that was broken down and flattened, and set out in a collectable manner, but again was not specifically intended for recycling. Another way that a false positive could occur would be if a set-out was mistakenly attributed to one address, when in fact it was set out by a different household.

As an attempt to review possible false positive issues, a simplified tabulation of overall monitoring results by building was prepared (see Attachment Six). CVC looked for all cases where there was only one set-out on one day at an address. At best, these would be examples of truly sporadic recycling behavior, or they might be explained by household turnover, with either the outgoing or incoming household engaged in recycling but not the other. We found 32 cases of these "singles", 9 on the West route and 23 on the East (an important contributor to that low ratio of average set-out rates to overall participation). By monitoring day, we found 4 on 5/15, 10 on 5/22, 6 on 5/30, 6 on 6/5, and 6 on 6/12. Of the 32 cases, 11 were noted by Rick Innes and 21 by Joellen Secondo. Upon reviewing these cases, a surprising number were specifically remembered due to other unusual circumstances. We were unable to identify any specific pattern suggesting false positives, but it must be conceded that there may well be one or two among these cases.